

IN THE CLAIMS:

Please amend the claims to read as follows:

1. (Original) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

electronically receiving financial market transaction data over an electronic network;

electronically storing in a computer-readable medium said received financial market transaction data;

constructing an inhomogeneous time series z that represents said received financial market transaction data;

constructing an exponential moving average operator;

constructing an iterated exponential moving average operator based on said exponential moving average operator;

constructing a time-translation-invariant, causal operator $\Omega[z]$ that is a convolution operator with kernel ω and that is based on said iterated exponential moving average operator;

electronically calculating values of one or more predictive factors relating to said time series z , wherein said one or more predictive factors are defined in terms of said operator $\Omega[z]$; and

electronically storing in a computer readable medium said calculated values of one or more predictive factors.

2. (Original) The method of claim 1, wherein said operator $\Omega[z]$ has the form:

$$\begin{aligned}\Omega[z](t) &= \int_{-\infty}^t dt' \omega(t-t') z(t') \\ &= \int_0^{\infty} dt' \omega(t') z(t-t').\end{aligned}$$

3. (Currently amended) The method of claim 1, wherein said exponential moving average operator $\text{EMA}[\tau; z]$ has the form:

$$\text{EMA}[\tau; z](t_n) = \mu \text{EMA}[\tau; z](t_{n-1}) + (\nu - \mu) z_{n-1} + (1 - \nu) z_n, \text{ with}$$

$$\left[\left[\alpha = \frac{\tau}{t_n - t_{n-1}} \right] \right] \alpha = \frac{t_n - t_{n-1}}{\tau}$$

$$\mu = e^{-\alpha},$$

where ν depends on a chosen interpolation scheme.

4. (Original) The method of claim 1, wherein said operator $\Omega[z]$ is a differential operator $\Delta[\tau]$ that has the form:

$$\Delta[\tau] = \gamma(\text{EMA}[\alpha\tau, 1] + \text{EMA}[\alpha\tau, 2] - 2\text{EMA}[\alpha\beta\tau, 4]),$$

where γ is fixed so that the integral of the kernel of the differential operator from the origin to the first zero is 1; α is fixed by a normalization condition that requires $\Delta[\tau; c] = 0$ for a constant c ; and β is chosen in order to get a short tail for the kernel of the differential operator $\Delta[\tau]$.

5. (Original) The method of claim 4 wherein said one or more predictive factors comprises a return of the form $r[\tau] = \Delta[\tau; x]$, where x represents a logarithmic price.

6. (Original) The method of claim 1 wherein said one or more predictive factors comprises a momentum of the form $x - \text{EMA}[\tau; x]$, where x represents a logarithmic price.

7. (Original) The method of claim 1 wherein said one or more predictive factors comprises a volatility.

8. (Original) The method of claim 7 wherein said volatility is of the form:

$$\text{Volatility}[\tau, \tau', p; z] = \text{MNorm}[\tau/2, p; \Delta[\tau'; z]], \text{ where}$$

$$\text{MNorm}[\tau, p; z] = \text{MA}[\tau; |z|^p]^{1/p}, \text{ and}$$

$$\text{MA}[\tau, n] = \frac{1}{n} \sum_{k=1}^n \text{EMA}[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1},$$

and where p satisfies $0 < p \leq 2$, and τ' is a time horizon of a return $r[\tau] = \Delta[\tau; x]$, where x represents a logarithmic price.

9. (Original) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

electronically receiving financial market transaction data over an electronic network;

electronically storing in a computer readable medium said received financial market transaction data;

constructing an inhomogeneous time series z that corresponds to said received financial market transaction data;

constructing an exponential moving average operator;

constructing an iterated exponential moving average operator based on said exponential moving average operator;

constructing a time-translation-invariant, causal operator $\Omega[z]$ that is a convolution operator with kernel ω and that is based on said iterated exponential moving average operator;

constructing a standardized time series z ;

electronically calculating values of one or more predictive factors relating to said time series z , wherein said one or more predictive factors are defined in terms of said standardized time series z ; and

electronically storing in a computer readable medium said calculated values of one or more predictive factors.

10. (Original) The method of claim 9 wherein the standardized time series z is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

where $MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}$.

11. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving skewness.

12. (Currently amended) The method of claim 11 wherein said moving skewness is of the form:

$$MSkewness[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^3]$$

where τ_1 is the length of a time interval around time "now" and τ_2 is the length of a time interval around time "now- τ ".

13. (Original) The method of claim 12 wherein the standardized time series \hat{z} is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

$$\text{where } MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}.$$

14. (Original) The method of claim 9 wherein said one or more predictive factors comprises a moving kurtosis.

15. (Original) The method of claim 14 wherein said moving kurtosis is of the form $MKurtosis[\tau_1, \tau_2; z] = MA[\tau_1; \hat{z}[\tau_2]^4]$,

where τ_1 is the length of a time interval around time "now" and τ_2 is the length of a time interval around time "now- τ ."

16. (Original) The method of claim 15 wherein the standardized time series \hat{z} is of the form:

$$\hat{z}[\tau] = \frac{z - MA[\tau; z]}{MSD[\tau; z]}$$

where

$$MA[\tau, n] = \frac{1}{n} \sum_{k=1}^n EMA[\tau', k], \text{ with } \tau' = \frac{2\tau}{n+1}, \text{ and}$$

$$\text{where } MSD[\tau, p; z] = MA[\tau; |z - MA[\tau; z]|^p]^{1/p}.$$

17. (Original) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

electronically receiving financial market transaction data over an electronic network;

electronically storing in a computer readable medium said received financial market transaction data;

constructing an inhomogeneous time series z that corresponds to said received financial market transaction data;

constructing an exponential moving average operator $EMA[\tau; z]$;

constructing an iterated exponential moving average operator based on said exponential moving average operator $EMA[\tau; z]$;

constructing a time-translation-invariant, causal operator $\Omega[z]$ that is a convolution operator with kernel ω and time range τ , and that is based on said iterated exponential moving average operator;

constructing a moving average operator MA that depends on said EMA operator;

constructing a moving standard deviation operator MSD that depends on said MA operator;

electronically calculating values of one or more predictive factors relating to said time series z , wherein said one or more predictive factors depend on one or more of said operators EMA, MA, and MSD; and

electronically storing in a computer readable medium said calculated values of one or more predictive factors.

18. (Original) The method of claim 17 wherein said one or more predictive factors comprises a moving correlation.

19. (Original) The method of claim 18 wherein said moving correlation is of the form:

$$MCorrelation[\hat{y}, \hat{z}](t) = \int_0^\infty \int_0^\infty dt' dt'' c(t', t'') \hat{y}(t - t') \hat{z}(t - t'').$$

20. (Original) A method of obtaining predictive information for inhomogeneous financial time series, comprising the steps of:

electronically receiving financial market transaction data over an electronic network;

electronically storing in a computer readable medium said received financial market transaction data;

constructing an inhomogeneous time series z that corresponds to said received financial market transaction data;

constructing a complex iterated exponential moving average operator $EMA[\tau; z]$, with kernel ema ;

constructing a time-translation-invariant, causal operator $\Omega[z]$ that is a convolution operator with kernel ω and time range τ , and that is based on said complex iterated exponential moving average operator;

constructing a windowed Fourier transform WF that depends on said EMA operator;

electronically calculating values of one or more predictive factors relating to said time series z , wherein said one or more predictive factors depend on said windowed Fourier transform; and

electronically storing in a computer readable medium said calculated values of one or more predictive factors.

21. (Currently amended) The method of claim 20 wherein said complex iterated exponential moving average operator EMA has a kernel ema of the form:

$$ema[\zeta, n](t) = \frac{1}{(n-1)!} \left(\frac{t}{\tau} \right)^{n-1} \frac{e^{-\zeta t}}{\tau}$$

where $[\zeta] \in C$, with $\zeta = \frac{1}{\tau}(1 + ik)$.

22. (Original) The method of claim 20 wherein EMA is computed using the iterative computational formula:

$$EMA[\zeta; z](t_n) = \mu EMA[\zeta; z](t_{n-1}) + z_{n-1} \frac{\nu - \mu}{1 + ik} + z_n \frac{1 - \nu}{1 + ik}, \text{ with}$$

$$\alpha = \zeta(t_n - t_{n-1})$$

$$\mu = e^{-\alpha}$$

where ν depends on a chosen interpolation scheme.

23. (Original) The method of claim 20 wherein said windowed Fourier transform has a kernel wf of the form:

$$wf[\tau, k, n](t) = \frac{1}{n} \sum_{j=1}^n ema[\zeta, j](t).$$

24. (Currently amended) The method of claim 23 wherein said ema is of the form:

$$ema[\zeta, n](t) = \frac{1}{(n-1)!} \left(\frac{t}{\tau} \right)^{n-1} \frac{e^{-\zeta t}}{\tau}$$

where $[\zeta] \in C$ with $\zeta = \frac{1}{\tau}(1 + ik)$.

25. (Original) A method of obtaining predictive information for inhomogeneous time series, comprising the steps of:

electronically receiving time series data over an electronic network;
electronically storing in a computer-readable medium said received time series data;
constructing an inhomogeneous time series z that represents said time series data;
constructing an exponential moving average operator;
constructing an iterated exponential moving average operator based on said exponential moving average operator;
constructing a time-translation-invariant, causal operator $\Omega[z]$ that is a convolution operator with kernel ω and that is based on said iterated exponential moving average operator;
electronically calculating values of one or more predictive factors relating to said time series z , wherein said one or more predictive factors are defined in terms of said operator $\Omega[z]$; and
electronically storing in a computer readable medium said calculated values of one or more predictive factors.